

**STATUS REVIEW OF Mertensia bella
U.S.D.A. FOREST SERVICE - REGION 1
LOLO NATIONAL FOREST
MONTANA**

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I. SUMMARY

Mertensia bella is a very distinctive member of the Bluebell Family, and is apparently without close allies (Hitchcock *et al.* 1959). It differs from all other species in the genus by having a corolla that flares from the base (in most species of the genus Mertensia, the corolla is divided into the tube and limb), leaves with lateral veins, and corm-like roots (Dorn 1984). It is listed as critically imperiled in Montana (S1 = 5 or fewer occurrences) (Achuff 1991), where it is known from a total of three locations on the southwest edge of Missoula County adjacent to Idaho. Survey work in 1991 revealed no new populations. In Montana, it has only been collected from sites within, or within and adjacent to clear-cuts. This species is also known from nine locations (meadows, forested slopes or seeps) in adjacent Idaho County, Idaho, and is apparently more common in western Oregon (Wayne Rolle, pers. comm., Jenny Demling, pers. comm. 1991). There are two possible explanations for the distribution of M. bella in Montana. It is either an introduced species, or a native with relict populations that have expanded into clear-cut areas. Arguments exist for both views. If a population of M. bella were to be located in Montana and or adjacent Idaho in undisturbed habitat, far from areas that have been disturbed by anthropogenic forces, it would add support to the latter explanation.

Populations currently occur in clear-cut areas that have been difficult to restock, and timber practices such as clear-cutting, mechanical site preparation for planting, and tree planting do not appear to be detrimental to populations of M. bella. If new populations of M. bella are located in native habitat, it is recommended that these populations be protected. If impacts to a native population are unavoidable, it is recommended that at least a portion of the population be protected, and that the entire population be monitored to determine the effects of the management action. To determine the effects of canopy closure on populations, a long term monitoring study should be initiated. Monitoring plots could be read every three to five years depending on rate of closure. Dick Creek (002) and Lost Park (003) would offer the best opportunities for this type of study. Additionally, the proximity of M. bella populations to roadways makes them susceptible to weed control activities. Weed control management teams should be aware of the presence of M. bella populations on the Lolo National Forest.

II. SPECIES INFORMATION

A. CLASSIFICATION

1. SCIENTIFIC NAME: Mertensia bella Piper.
Pertinent synonyms include Mertensia siskiyouensis (Williams 1937).
2. COMMON NAME: Oregon bluebell.
3. FAMILY: Boraginaceae (Borage Family).
4. GENUS: The Borage Family is a large cosmopolitan family that includes close to 100 genera, and well over 1500 species. The genus Mertensia contains 35-40 species native to extratropical Eurasia and North America (Hitchcock *et al.* 1959). Williams (1937) recognized 24 species in North America, most of them in the western United States. The highest concentration of Mertensia species occurs in the western half of Colorado, with a second smaller concentration in northern Idaho and adjacent Montana, Wyoming, Washington, and Oregon.
5. SPECIES: Dorn (1984) lists eight species of Mertensia for Montana. The type specimen for M. bella was collected in the Cascades of Lane County, Oregon by Peck in 1914 (Lorain 1988). The first collections from Montana were made in the Bitterroot Mountains by Marie Mooar in 1968.

Mertensia bella is a very distinctive species, and is apparently without close allies (Hitchcock *et al.* 1959). It differs from all other species in the genus by having a corolla that flares from the base (in most species of the genus Mertensia, the corolla is divided into the tube and limb). Mertensia bella is also notable for having leaves with evident lateral veins, and the presence of corms, rather than a rhizome or other types of rootstock (Dorn 1984). Although M. bella is placed alone in the Section Neurantheia, the characters of the corolla resemble most closely those of M. maritima (Section Steenhammera), more so than any of the true members of the genus Mertensia (Section Eumertensia) (Williams 1937). Williams also feels that the lack of fornices may indicate that M. bella is a "fairly recent species."

B. PRESENT LEGAL OR OTHER FORMAL STATUS**1. FEDERAL STATUS**

- a. U.S. FISH AND WILDLIFE SERVICE: None.
- b. U.S. FOREST SERVICE: Mertensia bella is currently included on the sensitive plant species list by Region 1 of the U.S. Forest Service. Agency objectives and policy in the 1984 Forest Service Manual provide for the management and protection of sensitive species (Section 2670.32). Under these guidelines, the U.S. Forest Service is to "(a)void or minimize impacts to species whose viability has been identified as a concern" (2670.32.2).

2. STATES

Globally, this species is listed by the Idaho Natural Heritage Program as "apparently secure = G4, although it may be quite rare in parts of its range, especially at the periphery" (Moseley and Groves 1990).

Montana: Mertensia bella is listed as critically imperiled in Montana (S1 = 5 or fewer occurrences), and is known from a total of three locations (Achuff 1991). Survey work in 1991 revealed no new populations.

Idaho: This species is on the monitor list in Idaho where it is known from 9 locations. Formal survey work has not been completed for this species in Idaho, and it may be more common there than the current number of locations indicates. A proposal has been submitted by the Idaho Natural Heritage Program for the 1992 field season to resurvey known M. bella locations, and search for new locations on the Nez Perce National Forest (Bob Moseley, pers. comm.).

C. DESCRIPTION

- 1. **GENERAL NONTECHNICAL DESCRIPTION:** Allied with the common bluebells, this plant has a single stem, from 4-16 inches in height, that arises from a round to oblong corm. The lowermost leaves are reduced in size, and sheath the base of the stem. The upper leaves are thin and ovate, and from 1-3

inches in length. These leaves are stalked (although the stalks become progressively shorter upwards along the stem), and the blade has distinctive lateral venation. The blue bell-shaped flowers are borne in an open inflorescence. Unlike most bluebells, this species does not have a long, constricted tube near the base of the bell. Instead, the lower two-thirds of the petals are fused to form a flaring bell-shaped corolla, from 0.3-0.4 of an inch in length. Short, sparsely hairy, fused green sepals (outer floral leaves) surround each flower (adapted from Reel *et al.* 1989).

2. **TECHNICAL DESCRIPTION:** Roots cormose, 2 cm or less in diameter, bearing many small fibrous roots; stems erect, 1-4 dm tall, pubescent above, glabrous below; basal leaves reduced to scarious, sheathing phyllodes; lowest stem-leaves broadly ovate or slightly subcordate, 1-5 cm long, 0.5-3cm broad, on narrowly winged petioles about as long as the blade; middle caudine leaves largest, ovate obtuse or acute, glabrous below or nearly so, strigillose above, 3-7 cm long, 1.5-5 cm broad, distinctly 3-6 parallel-veined, petiole shorter than the blade; upper leaves ovate-lanceolate to lanceolate, the uppermost leaves small, occasionally bract-like, 1-5 cm long, 0.5-3 cm broad, often strigillose below as well as above, sessile or nearly so, opposite; pedicels 0.3-1 cm long, slender, strigillose; inflorescence borne on long stipes from the axil of the leaves which they surpass, at least at maturity, flowers laxly to densely scorpioid or apparently umbellate; corolla blue, campanulate, 5-10 mm long, not divided into tube and limb, the lobes about 2 mm long, obtuse, fornices reduced to a slight thickening in the corolla tissue just above and alternate with the point of insertion of the filaments; anthers 1.2 mm long, oval; filaments very slender, not expanded, free portion about 1.5 mm long, inserted about 1 mm above the base of the corolla; style 4-5 mm long, reaching or exceeding the anthers; calyx-lobes 1.5-3 mm long, linear-lanceolate, acute or obtuse, densely strigillose on both sides; nutlets about 1.5 mm long, slightly rugose-roughened dorsally, scar small, about 0.25 mm long, near base; intrusion of gynobase high (adapted from Williams 1937).
3. **LOCAL FIELD CHARACTERS:** Mertensia bella is distinguished from all other Mertensia in Montana

by a combination of characters. These characters include, flowers that flare directly from the base, the presence of distinct lateral venation in the leaf blades and stems that arise from a corm-like root (rather than a rhizomes or other types of rootstalks). It occurs with M. paniculata which is taller (2-15 dm), arises from a multicipital caudex or stout rhizome, and has a corolla that is divided into a distinct limb and tube (Hitchcock *et al.* 1959). Photographs of the flower and habit of M. bella are found in Section VI, pp.22-27.

D. GEOGRAPHICAL DISTRIBUTION

1. RANGE: In Montana, M. bella is known from three locations, all on the southwest edge of Missoula County adjacent to Idaho. It has only been collected from sites within, or within and adjacent to clear-cuts.

A map (pg. 6) indicates the range of this species in Montana. The exact locations are shown on topographic map reproductions provided in Section V, pp. 20-21.

This species is also known from nine locations (meadows, forested slopes or seeps) in adjacent Idaho County, Idaho. In Oregon, it is known from Lane, Linn (west-central Cascades) and Josephine (Siskiyou Mountains) counties where it is apparently locally common (Wayne Rolle, pers. comm., Jenny Demling, pers. comm. 1991)

There are two possible explanations for the distribution of M. bella in Montana. It is either an introduced species, or a native with relict populations that have recently expanded into clear-cut areas. Arguments exist for both views.

The earliest collection of this species in Montana, Mooar (8392) 1968 was from "Elk Meadows Pass area, cut over, wet banks and small streams." The habitat description, and township, range and section given on the label indicate that the collection was probably from the Dick Creek (001) site, which was clear-cut in 1954. It was originally thought that this species might have been introduced from Idaho via logging operations (Andrew Kratz, pers. comm. 1991). Indeed, none of the Montana populations are solely in undisturbed habitat. A review of aerial photos from 1937

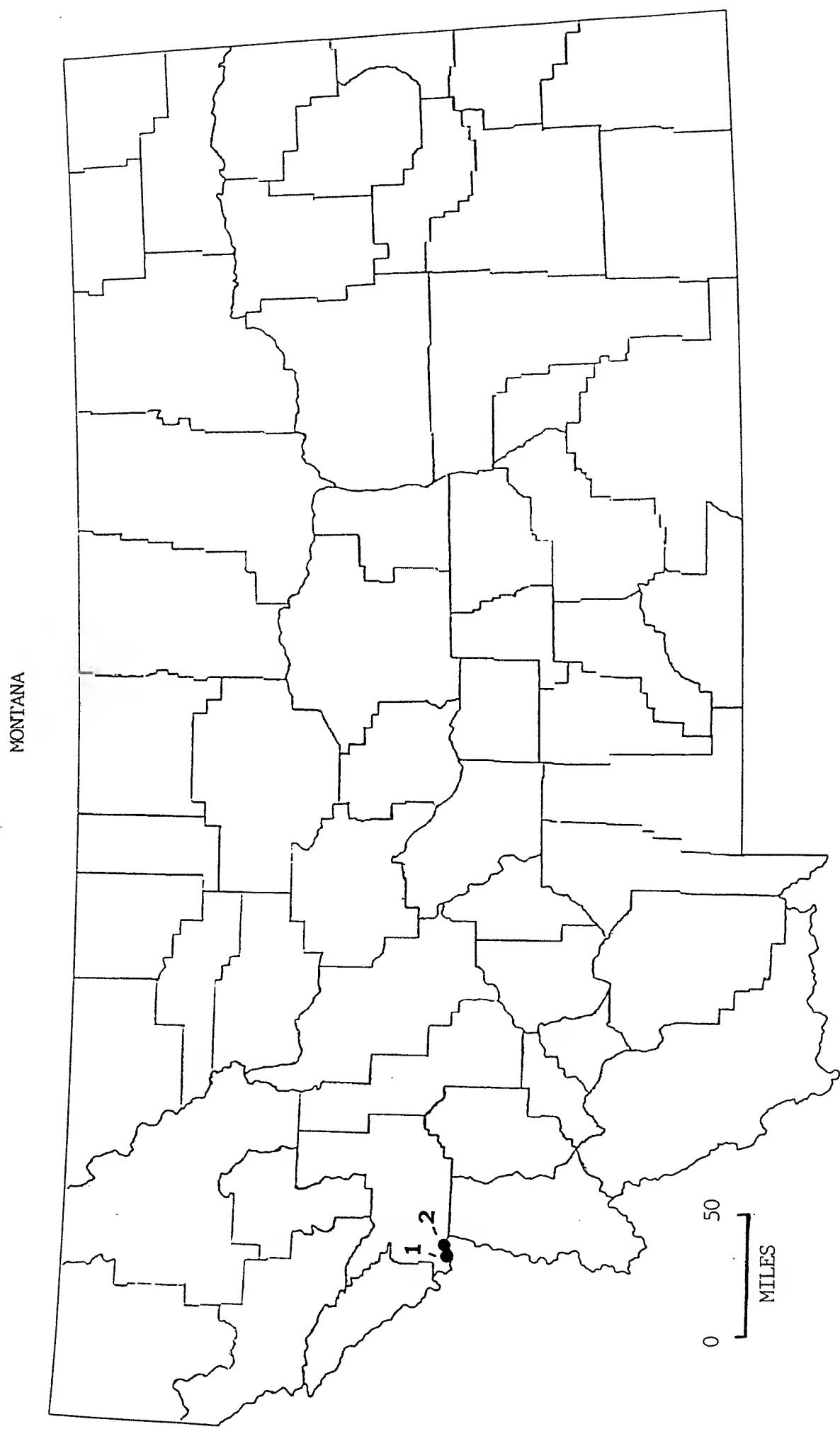


Figure 1. Distribution of Mertensia bella in Montana. (Numbers of populations at each dot are as indicated.)

indicate that present populations occur in areas that were under heavy tree cover prior to timber harvest. The open habitat favored by M. bella was not apparently present. In addition, surveys of undisturbed and altered sites with appropriate habitat within several miles of the known locations for M. bella locations revealed no new populations. Also, many of the timber contracts in the area were completed by Idaho companies (Vick Applegate, pers. comm. 1991). Thus it is possible that M. bella was brought in during logging operations.

Alternatively, many Pacific coastal disjuncts that occur in the northern Rocky Mountains are commonly accepted to represent relict populations of a once widespread mesic temperate Miocene flora. Lorain (1988) postulated a migration route for M. bella from the Siskiyou Mountains in Oregon to west-central Idaho at some point after the Cretaceous when these mountains were uplifted. It is possible that relict populations existed prior to timber harvest in Montana, and that the plant was merely able to take advantage of the new habitat.

Until a population is located in undisturbed habitat, far from areas that have been disturbed by anthropogenic forces, it will not be known if M. bella is a native or introduced species in Montana.

2. **CURRENT SITES:** Mertensia bella is documented from three sites in Montana. All of the sites occur wholly on U.S. Forest Service lands, Lolo National Forest. The locations of these sites, including the legal descriptions, latitude and longitude, elevations, and USGS topographic quadrangle names, are provided in the Element Occurrence Records (Section V., pp. 16-19). Field surveys were conducted by Andrew Kratz (Lolo National Forest) on 20, 22, and 24 June, and on July 10, 11, 24-26 July 1989 and on 3, 5, and 6 July 1990. Field surveys were also conducted by Lisa Schassberger Roe (Montana Natural Heritage Program) on 24-28 June 1991.
 - a. **Dick Creek (001)**
First Observation: 1968, Marie Mooar, herbarium collection.
Last Observation: 1991, Lisa S. Roe, Montana Natural Heritage Program, Helena, MT.

Habitat: Clear-cut in 1954; not considered restocked, see Section VI, photograph b., p. 24.

b. Dick Creek (002)

First Observation: 1989, Andrew Kratz, Lolo National Forest, Missoula, MT.

Last Observation: 1991, Lisa S. Roe, Montana Natural Heritage Program, Helena, MT.

Habitat: Clear-cut below road in 1965, and above road in 1975. This area is considered restocked but looks similar to Dick Creek (001).

c. Lost Park (003)

First Observation: 1990, Andrew Kratz, Lolo National Forest, Missoula, MT.

Last Observation: 1991, Lisa S. Roe, Montana Natural Heritage Program, Helena, MT.

Habitat: Clear-cut in 1977. Mertensia bella also located along and within the forest margin at the lower edge of the clear-cut.

3. HISTORICAL SITES: None known.

4. UNVERIFIED/UNDOCUMENTED REPORTS: None known.

5. AREAS SURVEYED BUT SPECIES NOT LOCATED: The following areas were surveyed for M. bella because the habitat appeared to be suitable on topographic maps, but the species was not located within them. The actual areas surveyed may be smaller than the portions of the sections indicated.

The 1989-1990 field surveys by Andrew Kratz on the Lolo National Forest:

10N 23W SEC 4, NE $\frac{1}{4}$
 11N 22W SEC 18, SE $\frac{1}{4}$, SE $\frac{1}{4}$
 11N 22W SEC 19, N $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$
 11N 22W SEC 20, NW $\frac{1}{4}$ NW $\frac{1}{4}$
 11N 22W SEC 21, NW $\frac{1}{4}$, SW $\frac{1}{4}$
 11N 22W SEC 28, NE $\frac{1}{4}$, SE $\frac{1}{4}$
 11N 23W SEC 32, SE $\frac{1}{4}$, SE $\frac{1}{4}$, NW $\frac{1}{4}$, SW $\frac{1}{4}$
 11N 24W SEC 21, NE $\frac{1}{4}$, SE $\frac{1}{4}$, SE $\frac{1}{4}$, NE $\frac{1}{4}$
 11N 24W SEC 22, SE $\frac{1}{4}$
 11N 24W SEC 33, SE $\frac{1}{4}$
 11N 24W SEC 34, NE $\frac{1}{4}$, SW $\frac{1}{4}$, NW $\frac{1}{4}$
 11N 24W SEC 36, SW $\frac{1}{4}$, NW $\frac{1}{4}$

The 1991 field surveys by Lisa Schassberger Roe on the Lolo National Forest:

10N 23W SEC 10, SW $\frac{1}{4}$ SW $\frac{1}{4}$
 10N 23W SEC 4, SE $\frac{1}{4}$ SW $\frac{1}{4}$
 10N 23W SEC 6, SE $\frac{1}{4}$ SE $\frac{1}{4}$
 10N 24W SEC 1, NE $\frac{1}{4}$ NE $\frac{1}{4}$
 11N 22W SEC 11, NW $\frac{1}{4}$ SE $\frac{1}{4}$
 11N 22W SEC 12, NW $\frac{1}{4}$ SW $\frac{1}{4}$
 11N 22W SEC 14, NE $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$
 11N 22W SEC 22, SE $\frac{1}{4}$ NE $\frac{1}{4}$
 11N 22W SEC 23, NW $\frac{1}{4}$ NW $\frac{1}{4}$
 11N 22W SEC 26, SW $\frac{1}{4}$ SW $\frac{1}{4}$
 11N 22W SEC 27, NW $\frac{1}{4}$ SW $\frac{1}{4}$
 11N 22W SEC 30, NW $\frac{1}{4}$ NE $\frac{1}{4}$
 11N 22W SEC 32, NE $\frac{1}{4}$ SE $\frac{1}{4}$
 11N 22W SEC 33, SE $\frac{1}{4}$ NW $\frac{1}{4}$
 11N 22W SEC 35, NW $\frac{1}{4}$ NW $\frac{1}{4}$
 11N 22W SEC 6, SE $\frac{1}{4}$ NW $\frac{1}{4}$
 11N 23W SEC 31, SW $\frac{1}{4}$ SW $\frac{1}{4}$
 11N 24W SEC 21, SW $\frac{1}{4}$ NE $\frac{1}{4}$
 11N 24W SEC 28, SE $\frac{1}{4}$ SE $\frac{1}{4}$
 11N 24W SEC 33, SW $\frac{1}{4}$ NE $\frac{1}{4}$
 11N 24W SEC 34, NE $\frac{1}{4}$ SE $\frac{1}{4}$
 11N 24W SEC 34, NW $\frac{1}{4}$
 11N 24W SEC 36, SE $\frac{1}{4}$ SE $\frac{1}{4}$

E. HABITAT

1. **GENERAL HABITAT DESCRIPTION:** Mertensia bella occurs in wet, seepy open or partially shaded forblands. Populations often occur beneath alder stands in the montane to subalpine zones. In Montana, populations occur on slopes that range from 5-35 percent, and on all aspects except south. Populations have been found on south aspects in Idaho. All of the Montana populations occur within or adjacent to clear-cuts. Photographs, Section VI, pp. 22-27 document the habitat of M. bella in Montana.
2. **ASSOCIATED VEGETATION:** The most common associates of M. bella include Alnus sinuata (Sitka alder) and Boykinia major (mountain boykinia). Other commonly associated species include:

Abies lasiocarpa (subalpine fir)
Picea engelmannii (Engelmann spruce)

Athyrium filix-femina (ladyfern)
Arnica latifolia (broadleaf arnica)
Calamagrostis canadensis (bluejoint reedgrass)
Claytonia lanceolata (western springbeauty)
Disporum trachycarpum (wartberry fairy-bell)

Dodecatheon jeffreyi (tall mountain shooting star)
Epilobium angustifolium (fireweed)
Erythronium grandiflorum (glacier lily)
Galium triflorum (sweetscented bedstraw)
Hydrophyllum capitatum (ballhead waterleaf)
Lonicera utahensis (Utah honeysuckle)
Lupinus polyphyllus (many-leaved lupine)
Luzula hitchcockii (smooth woodrush)
Menziesia ferruginea (fool's huckleberry)
Mertensia paniculata (panicle bluebells)
Mitella breweri (Brewer's mitrewort)
Mitella stauropetala (side-flowered mitrewort)
Montia cordifolia (broad-leaved montia)
Polemonium occidentale (western polemonium)
Ranunculus populaqo (mountain buttercup)
Ribes lacustre (swamp current)
Rubus laciniatus (evergreen blackberry)
Rubus parviflorus (thimbleberry)
Sambucus racemosa (red elderberry)
Senecio triangularis (arrowleaf groundsel)
Thalictrum occidentale (western meadowrue)
Trautvetteria carolinensis (false bugbane)
Trillium ovatum (white trillium)
Vaccinium globulare (globe huckleberry)
Valeriana sitchensis (Sitka valerian)
Veratrum viride (green false hellebore)
Viola glabella (pioneer violet)

3. **TOPOGRAPHY:** In Montana, populations occur in mountainous regions, on sites that range from 5-35 percent slope. The elevations of these sites range from 6100 to 6300 feet (1860-1920 m). In Idaho, populations have been located as low as 4300 feet (1310 m), and as high as 6300 feet (1920 m) in elevation.
4. **SOIL RELATIONSHIPS:** In Montana and Idaho, populations of M. bella occur on sites with soils derived from granite of the Idaho batholith. It is not known if soils are significant with respect to this plant's distribution.
5. **REGIONAL CLIMATE:** Visher (1954) states that this region of western Montana falls into the Koppen classification as a Canadian climate, dominated by snowy winters and moderately warm summers, with needle leaved trees as the dominant species.

The climatic station closest to the Montana M. bella populations is at Savage Pass, Idaho (elevation 6170 ft (1880 m)). The station is approximately 14 miles southwest of the Montana

populations. USDA Soil Conservation Service, Central Forecasting System (CFS) data were averaged over an 8 year period (1984-1991) for Savage Pass. For this period, the mean annual temperature was 31.15° F (1.75° C) with a mean maximum in July of 55.94° F (13.3° C) and a mean minimum in December of 17.42° F (-8.1° C). The average annual precipitation was 43.29 inches. The highest precipitation (snow) occurs in the months of January (5.34 inches) and February (4.46 inches). From a precipitation isoline map, the three sites in Montana are in an area that is predicted to have an average annual precipitation of 60 inches (U.S. Department of Agriculture 1986).

Precipitation and hydrology may play an important role in the distribution of *M. bella* populations. In Oregon, this species is found only west of the Cascades, while in Idaho it occurs in the moist northeastern forests.

F. POPULATION DEMOGRAPHY AND BIOLOGY

1. **PHENOLOGY:** Flowering begins in late May and may extend into early July. The early flowering date, and information from a herbarium collection (Mooar, M. (7851) MONTU, "very wet snow melt area, June 4, 1968), indicate that shoot growth may begin before snow-melt (growth can begin as soon as temperatures reach 0° (Larcher 1983)).
2. **POPULATION SIZE AND CONDITION:** Dick Creek (001) contains ca. 1000 individuals, and covers about 8 acres. Dick Creek (002) contains 1000-3000 plants and covers about 35 acres, while Lost Park (003) contains ca. 10,000 individuals (possibly more), and covers about 20 acres. All of the populations appeared to be in good condition.
3. **REPRODUCTIVE BIOLOGY**
 - a. **TYPE OF REPRODUCTION:** A perennial, *M. bella* grows from a corm-like root each year. After flowering and setting seed, the plant dies back to the root.
 - b. **POLLINATION BIOLOGY:** Not known.
 - c. **SEED DISPERSAL AND BIOLOGY:** Seed viability is not known.

G. POPULATION ECOLOGY

1. BIOLOGICAL INTERACTIONS

a. **COMPETITION:** From habitat observations, M. bella does not occur in areas where ground cover is high during its growth and flowering stages. Although it occurs in areas with open light, to areas partially shaded by shrub and tree cover, forb and grass cover are always low during its growth and flowering stages (see Section VI, photograph b., p. 24). In many cases, it was most common on recently exposed soils of rodent mounds or new roadbed.

b. **HERBIVORY:** None observed.

H. LAND OWNERSHIP

1. Lolo National Forest, Missoula Ranger District

Dick Creek (001)
Dick Creek (002)
Lost Park (003)

III. ASSESSMENT AND MANAGEMENT RECOMMENDATIONS

A. THREATS TO CURRENTLY KNOWN POPULATIONS

1. **GRAZING:** Grazing does not currently appear to threaten the habitat of M. bella. This plant generally blooms in May and June, and is mostly dormant by July and August when grazing allotments are generally opened.
2. **MINING:** Does not currently pose a threat.
3. **TIMBER HARVESTING:** To date, M. bella has only been located in clear-cuts, where surface moisture is present from May through June. Timber harvest may actually benefit this species, unless it were to significantly change the hydrology of a site.
4. **WEED CONTROL ACTIVITIES:** Like any dicotyledon, M. bella would be susceptible to weed control activity. Populations are particularly susceptible due to their proximity to roadways and their presence in clear-cuts. Weed control management teams should be aware of the presence of M. bella populations on the Lolo National Forest.

- B. **MANAGEMENT PRACTICES AND RESPONSE:** Observations to date indicate that ground disturbance is not detrimental to this species, and may even benefit it. However, these observations are limited, and it is not known if clear-cutting might in some cases eliminate populations of M. bella. The effects of management actions should be monitored where possible.
- C. **RECOMMENDATIONS FOR MAINTAINING VIABLE POPULATIONS:** Populations currently occur in clear-cut areas that have been difficult to restock. Timber practices such as clear-cutting, mechanical site preparation for planting, and tree planting do not appear to be detrimental to populations M. bella. If a population of M. bella is located in native habitat in Montana it should be preserved. If management practices such timber harvest are unavoidable, at least a portion of the population should be protected, and the entire population monitored to determine the effects of the harvest.
- D. **RECOMMENDATIONS FOR FURTHER ASSESSMENT:** Although access is limited, further survey work should be completed in Montana, south of the known populations. Until a population is located in undisturbed habitat, it will not be known if M. bella is native or introduced. To determine the effects of canopy closure, a long term monitoring study should be initiated. Monitoring plots could be read every three to five years depending on rate of closure. Dick Creek (002) and Lost Park (003) would offer the best opportunities for monitoring studies.

IV. LITERATURE CITED

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V. ELEMENT OCCURRENCE PRINT-OUTS AND MAPS

Occurrence number: 001

Global rank: G4 Forest Service status: SENSITIVE
State rank: S1 Federal Status:

Survey site name: DICK CREEK
EO rank: C

EO rank comments: POPULATION IN CLEAR-CUT WITH
CONTINUING MANAGEMENT PLANS.

County: MISSOULA

USGS quadrangle: DICK CREEK

Township: 011N Range: 022W Section: 33 Precision: S
Township-range comments: NE4, 28SE4SE4

Survey date: 1991-06-25 Elevation: 6330
First observation: 1968 Slope/aspect: 6% / EAST
Last observation: 1991-06-25 Size (acres): 8

Location:

BITTERROOT MOUNTAINS, HEAD OF DICK CREEK, 1.5 MILES ENE OF SKOOKUM
BUTTE, 21 MILES SOUTHWEST OF MISSOULA.

Element occurrence data:

1991: COMMON ALONG WEST EDGE OF CLEAR-CUT, CA. 1000 PLANTS. 1989:
ABUNDANT IN PATCHES. HERBARIUM LABEL: "INFREQUENT." BPA RIVERS STUDY:
"COMMON."

General site description:

MOIST TO WET (SPRINGY) SLOPE; SUBALPINE TALL-HERBLAND. ASSOCIATED
SPECIES: CALAMAGROSTIS CANADENSIS, TRAUTVETTERIA CAROLINIENSIS,
VALERIANA SITCHENSIS, MERTENSIA PANICULATA.

Land owner/manager:

LOLO NATIONAL FOREST, MISSOULA RANGER DISTRICT

Comments:

VOUCHERS - MOOAR, M. (7851, 8392), 1968, SPECIMEN #s 101638, 101639
(MONTU); LACKSCHEWITZ, K.H. (3701), 1972, SPECIMEN #070088 (MONTU),
DUP. SPECIMEN AT WTU; STICKNEY, P. F. (1934). 19???. (MONT), KRATZ, A.
M. (89062201). 1989. ABUNDANT IN PATCHES, BUT ONLY FOUND WHERE
DISTURBED BY HEAVY EQUIPMENT. ECODATA PLOT # 163C89K002.

Information source:

ROE, LISA S., MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVE.,
HELENA, MT 59620. (436). 1991. MONT.

Occurrence number: 002

Global rank: G4 Forest Service status: SENSITIVE
 State rank: S1 Federal Status:

Survey site name: DICK CREEK
 EO rank: C

EO rank comments: UPPER AREA CLEAR-CUT IN 1979, TIMBER RECOVERY
 POOR, BUT RECOVERY MAY THREATEN PLANTS,
 LOWER AREA CLEAR-CUT IN 1955.

County: MISSOULA

USGS quadrangle: DICK CREEK

Township: 011N Range: 022W Section: 34 Precision: S
 Township-range comments: SW4NE4, NW4SE4

Survey date:	1991-06-25	Elevation:	6600
First observation:	1989	Slope/aspect:	15-35% / WEST
Last observation:	1991-06-25	Size (acres):	35

Location:

BITTERROOT MOUNTAINS, HEAD OF DICK CREEK, 1.5 MILES ENE OF SKOOKUM BUTTE, CA. 21 MILES SOUTHWEST OF MISSOULA.

Element occurrence data:

1991: EXTENDED POPULATION WEST, CA. 1000-3000 PLANTS. 1990: 1000'S IN CLEAR-CUT AREA, AND MANY 100'S JUST NORTH IN DISTURBED FOREST. 1988: 88 GENETS COUNTED, 99% SEED DISPERSING

General site description:

1990: *ABIES LASIOCARPA/CALAMAGROSTIS CANADENSIS* HABITAT TYPE.
 ASSOCIATED SPECIES: *TRAUTVETTERIA CAROLINIENSIS*, *PICEA ENGELMANNII*,
RIBES LACUSTRE, *RUBUS LACINIATUS*, *RUBUS PARVIFLORUS*, *VACCINUM GLOBULARE*, *SENECIO TRIANGULARIS*, *TRILLIUM OVATUM*, *EPILOBIUM ANGUSTIFOLIUM*, *THALICTRUM OCCIDENTALE*, *ATHYRIUM FILIX-FEMINA*, *HYDROPHYLLUM CAPITATUM*, ETC. (SEE COMPLETE LIST ON FILE AT MTNHP).
 1979: PLANTS OCCUR ON MOIST ROADCUT AND CLEAR-CUT.

Land owner/manager:

LOLO NATIONAL FOREST, MISSOULA RANGER DISTRICT

Comments:

1989: 24 JULY IS LATE IN THE YEAR TO FIND *MERTENSIA BELLA*.
 VOUCHER-KRATZ, ANDREW, (900702001), 1990, MRC.

Information source:

ROE, LISA S., MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVE.
 HELENA MT 59624. (437) 1991. MONT.

Occurrence number: 003

Global rank: G4 Forest Service status: SENSITIVE
 State rank: S1 Federal Status:

Survey site name: LOST PARK
 EO rank:

EO rank comments:

County: MISSOULA

USGS quadrangle: WEST FORK BUTTE

Township: 010N Range: 023W Section: 10 Precision: S
 Township-range comments: NW4SE4

Survey date:	1991-06-27	Elevation:	6120
First observation:	1990	Slope/aspect:	5-20% / NORTH TO WEST
Last observation:	1991-06-27	Size (acres):	20

Location:

LOST PARK AREA, ESE OF LOLO HOT SPRINGS; AT END OF ROAD #2195 IN A CLEAR-CUT AND ADJOINING FOREST.

Element occurrence data:

1991: ONLY CA. 10,000 PLANTS. 1990: YOUNG PLANTS AND SEEDLINGS ABUNDANT. 10,000-100,000 INDIVIDUALS; 50% IN FLOWER, 50% VEGETATIVE.

General site description:

FOREST EDGES OF *ABIES LASiocarpa*/*CALAMAGROSTIS CANADENSIS* OR *LASIOCARPA/LUZULA HITCHCOCKII* HABITAT TYPE. ASSOCIATED SPECIES: *PICEA ENGELMANNII*, *VACCINIUM GLOBULARE*, *MENZIESIA FERRUGINEA*, *RIBES LACUSTRE*, *LONICERA UTAHENSIS*, *VERATRUM VIRIDE*, *DISPORUM TRACHYCARPUM*, *TRILLIUM OVATUM*, *THALICTRUM OCCIDENTALE*, *SENECIO TRIANGULARIS*, *ATHYRIUM FILIX-FEMINA*, *LUPINUS POLYPHYLLUS*, ETC. (COMPLETE LIST ON FILE AT MTNHP). CLEAR-CUT IS FORB COMMUNITY AND ALDER IN PLACES, WITH: *MONTIA CORDIFOLIA*, *MERTENSIA PANICULATA*, *SAMBUCUS RACEMOSA*, *POLEMONIUM OCCIDENTALE*.

Land owner/manager:

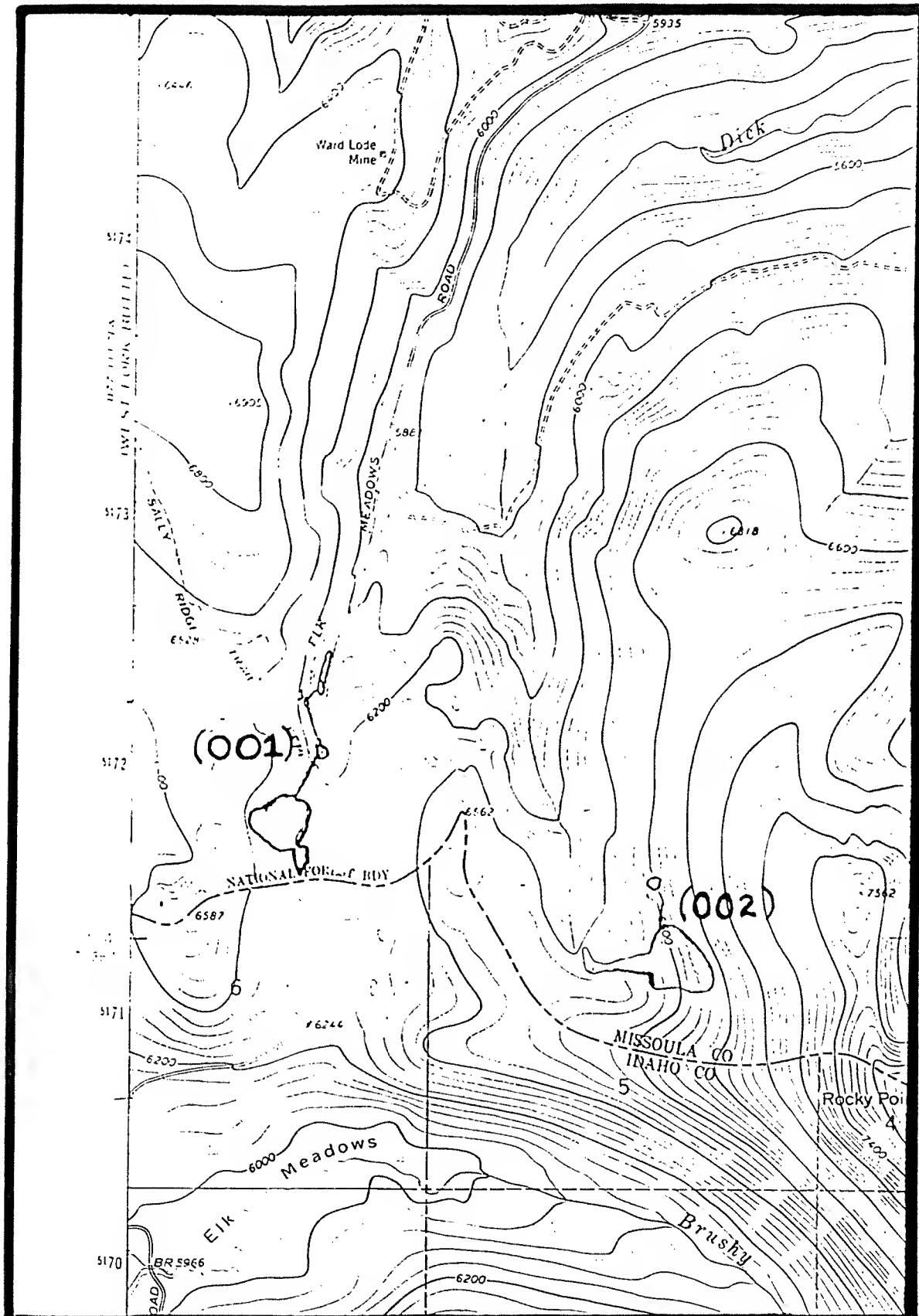
LOLO NATIONAL FOREST, MISSOULA RANGER DISTRICT

Comments:

VOUCHERS - KRATZ, A. (900705001), 1990, MRC & MONTU. BOYKINIA MAJOR SEEMS TO BE RELIABLE INDICATOR OF SUITABLE HABITAT FOR MERTENSIA BELLA. 1991: 1990 POPULATION ESTIMATE SEEKS HIGH.

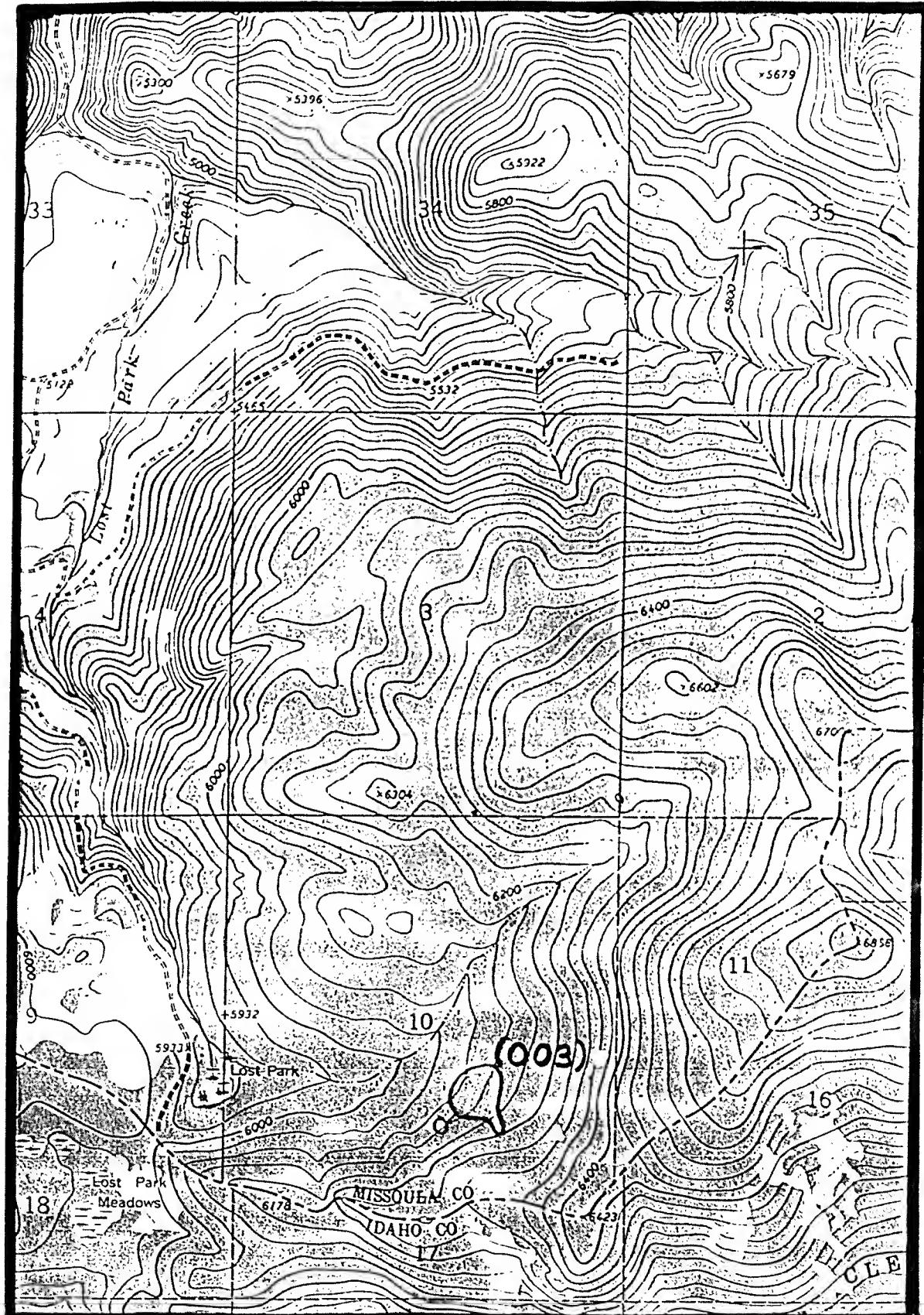
Information source:

ROE, LISA S., MONTANA NATURAL HERITAGE PROGRAM, 1515 EAST SIXTH AVE., HELENA, MT 59620. (438). 1991. MONT.



Mertensia bella

Dick Creek (001)
Dick Creek (002)



Mertensia bella

Lost Park (003)

VI. PHOTOGRAPHS



A. Mertensia bella - flower.



- B. Mertensia bella - habit. Note that the grasses will eventually overtop M. bella.



- C. Mertensia bella - habitat (in Idaho (T38N/R17E/S6 NE4SW4) south and west of Dick Creek populations), alder stand adjacent to spruce forest and clearcut.



D. Mertensia bella - habitat (clearcut), Dick Creek (001), Montana.



E. Mertensia bella - habitat (clearcut and edge of woods in background), Lost Park (003), Montana.

